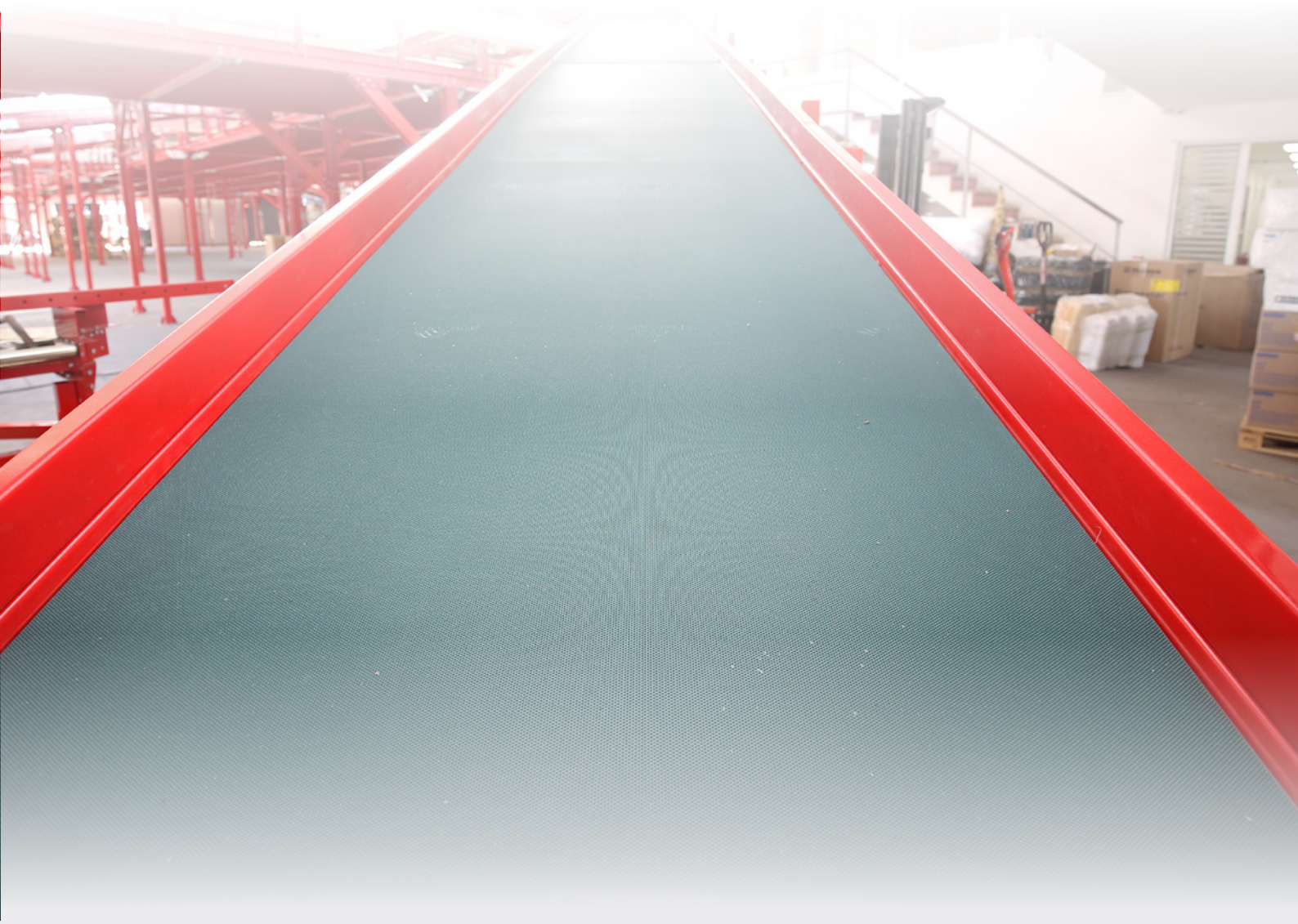
QUALITY PERFORMS.



Blocked Urethane Prepolymers

for elastomers, 1K and 2K coatings, and binders

Trixene® Blocked Prepolymers

Adiprene® BL Blocked Prepolymers

Adiprene® K Blocked Prepolymers

QUALITY WORKS.

LANXESS Energizing Chemistry

LANXESS IS A LEADING INNOVATOR OF BLOCKED PREPOLYMERS FOR ELASTOMERS, COATINGS AND BINDERS

LANXESS Urethane Systems, a world leader in polyurethane solutions, offers blocked prepolymers that are used in 1K and 2K systems for elastomers, coatings and binders. These heat-cured systems provide superior processing and productivity with controlled curing for virtually infinite pot life at room temperature. There is no need for mixing, weighing, or blending, making them easy to use and reducing waste and material handling. With low viscosity, they can be processed more easily into complex shapes.

Blocked prepolymers deliver enhanced performance, they are resilient to side effects caused by atmospheric moisture and traces of water in coating solvents and other ingredients. Due to blocking technology they can be formulated with non-traditional raw materials, such as new curative types, enabling properties that are not possible with conventional blocked prepolymers. In their blocked state, no exposure to free isocyanates occurs.

Our portfolio includes products designed on low free (LF) isocyanate prepolymer technology, which reduces the free isocyanate content that could be released during processing to below 0.1%. These products improve industrial hygiene even during processing

Benefits of blocked prepolymers

- Superior processing and high productivity
- No handling of free isocyanate
- Enhanced performance

OFFERING A RANGE OF BLOCKED PREPOLYMER TECHNOLOGIES TO SUIT DIFFERENT APPLICATION NEEDS

LANXESS manufactures and supplies an extensive portfolio of Trixene® and Adiprene® blocked prepolymers that incorporate a broad range of isocyanate and polyol chemistries. They are blocked with a range of blocking agents, including 3,5-dimethylpyrazole (DMP), ε-caprolactam (ε-CAP), methylethylketoxime (MEKO) and diethyl malonate (DEM), which are designed to unblock at specific curing temperatures and can be tailored to your specific needs.

This brochure describes the following blocked prepolymer technologies:

- Trixene® prepolymers used as flexibilizers for 2K epoxy systems in coating and adhesive applications
- Adiprene® BL blocked prepolymer binders for abrasive applications
- Adiprene® K blocked low free urethane elastomer systems for cast and coating applications

TRIXENE® BLOCKED AROMATIC PREPOLYMERS USED AS EPOXY FLEXIBILIZERS FOR COATINGS AND ADHESIVES

Epoxy resins have excellent properties and are widely used in corrosion protection coatings and flooring applications. Due to their high mechanical rigidity they can be brittle and tough, therefore need to be flexibilized to suit specific applications including; industrial and antibacterial flooring, parking decks and flooring adhesives. Trixene® blocked urethane prepolymers improve flexibility and impact resistance of epoxy coatings, without compromising chemical resistance. These blocked prepolymers readily react with standard amine hardeners used in 2K epoxy resin formulations, allowing permanent flexibilization of the end product.

Epoxy flexibilizers for coatings and adhesives

Selected products used

Trixene® BI 7774
Trixene® DP9C/537

Uses

- Providing necessary flexibility to normally brittle epoxy coatings to avoid crack formation and loss of protection to protective coatings
- Improve flooring flexibility and modify the impact resistance – design 'soft feel' of a floor specific to end-use requirements
- Providing necessary durability and flexibility to adhesives to bond flooring substrates with different thermal expansion and improve acoustic properties

Benefits

- Nonylphenol-free products
- Blocking agent of natural origin used in Trixene® BI 7774
- Ability to tailor the flexibility by varying the ratio of epoxy to urethane
- Providing excellent durability to coatings and adhesives for longer lifetime

Selected Product Grades	Chemistry	Nominal NCO content (%)	Solids (%)	Viscosity at 25°C (mPa·s)	Blocking Agent	Solvent
Trixene® BI 7770	TDI	2.25	100	60,000 - 100,000	Nonyl phenol	None
Trixene® BI 7771	TDI	2.20	100	70,000 - 130,000	Nonyl phenol	None
Trixene® BI 7774	TDI	2.25	100	25,000 - 55,000	Cardanol	None
Trixene® BI 7779	TDI	2.00	90	20,000 - 47,000	Nonyl phenol	Dioctyl adipate
Trixene® DP 9C/537	TDI	1.90	90	15,000 - 25,000	Cardanol	Dioctyl adipate

Data provided in the table above is characteristic of the product grade, and does not constitute a specification. Further information is given in technical and material safety data sheets for individual Trixene® BI products. Samples, supplementary data, formulating advice and papers/ presentations giving further details of our blocked prepolymer chemistry can be supplied on request.

ADIPRENE® BL BLOCKED PREPOLYMER BINDERS FOR ABRASIVE APPLICATIONS

Adiprene® and Trixene® blocked prepolymer binders are used to manufacture coated and bonded abrasives for a variety of end-uses. Urethane prepolymers are critical to formulate an elastic binder that can withstand stress upon grinding and tolerate heat build-up during use. Thus, binders must exhibit high cut and tear strength, good thermal resistance and long pot life. LANXESS' broad portfolio of MDI and TDI systems includes low free isocyanate prepolymer grades as well as offering customized solutions to suit end use application needs.

Selected products used

Adiprene® BL 16
Adiprene® BL 40

Uses

- Elastic, high performance binders for abrasive particles, mineral fillers, or for impregnating fabrics

Benefits

- Wide processing window and controlled cure
- Enhanced mechanical properties for high performance abrasive binders
- Designed polyol component for superior heat resistance
- LF technology for improved industrial hygiene

Selected Product Grades	Chemistry	Nominal NCO content (%)	Solids (%)	Viscosity at 25°C (mPa·s)	Viscosity at 50°C (mPa·s)	Deblocking Temperature (°C)
Trixene® BI 7674	TDI	3.70	58	< 2,000	–	120
Trixene® BI 7675	TDI	4.90	75	1,500 - 2,500	–	120
Trixene® DP9C/203	TDI	5.40	68	500 - 1,500	–	120
Trixene® DP9B/1957	TDI	3.80	58	< 5,000	–	120
Adiprene® BL 16	TDI	5.55	100	–	7,500 - 16,500	120
Adiprene® BL 40	LF TDI	6.30	87	–	1,400 - 2,000	120
Adiprene® BL 46	TDI	6.90	85	–	1,200 - 2,500	120
Adiprene® BLM 500	LF MDI	4.40	100	–	12,000 - 35,000	120 - 130

Data provided in the table above is characteristic of the product grade, and does not constitute a specification. Further information is given in technical and material safety data sheets for individual Trixene® BI and Adiprene® BL products. Samples, supplementary data, formulating advice and papers/ presentations giving further details of our blocked prepolymer chemistry can be supplied on request.

ADIPRENE® K BLOCKED, 1K URETHANE ELASTOMER SYSTEMS FOR ELASTOMERS AND FLEXIBLE COATINGS

Adiprene® K urethane elastomer systems are fully formulated, 1K systems that include the prepolymer, a blocking agent and a curative. Adiprene® K elastomer systems are not limited to LF MDI prepolymers and can be designed with other prepolymer types to tailor the system to your needs. These systems, based on low free (LF) isocyanate technology, are designed for simple processing, superior industrial hygiene, and enhanced performance.

Excellent processing and productivity

Adiprene® K blocked elastomers are stable at room temperature, offer controlled curing with outstanding pot life at processing temperatures, and are fast curing for high productivity. Adiprene® K blocked elastomers are significantly less viscous that other CAP-blocked prepolymers due to the use of LF technology, making them easier to process into complex parts.

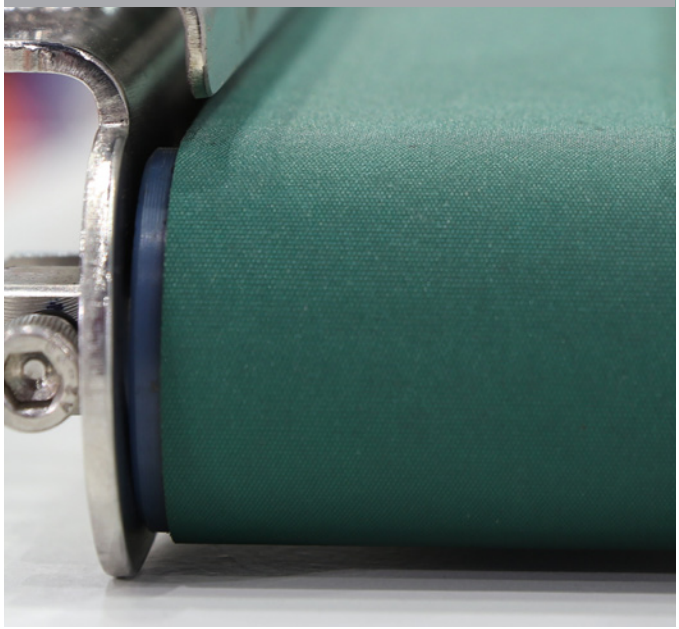
Superior industrial hygiene

Adiprene® K products are based on low free (LF) isocyanate prepolymer technology which reduces the free isocyanates that could be released during processing to below 0.1%. These products are blocked with ε-caprolactam (CAP), which has lower toxicity concerns than other blocking agents. Adiprene® K blocked elastomers have lower hazard classifications and can deliver superior industrial hygiene.

Enhanced performance

Adiprene® K blocked elastomers are formulated with specific curatives to tailor performance to meet customer needs. As a result of the lower viscosities and improved morphology, which come from using low free isocyanate technology, Adiprene® K blocked elastomers can be formulated with non-traditional raw materials, such as more viscous polyols or new curative types, enabling properties that are not possible with conventional prepolymers.

Elastomers & Thick Coatings



Selected products used

Adiprene® K LFM E820

Uses

- Impregnating fabric belts
- Large or complex cast parts
- Rotomolding

Benefits

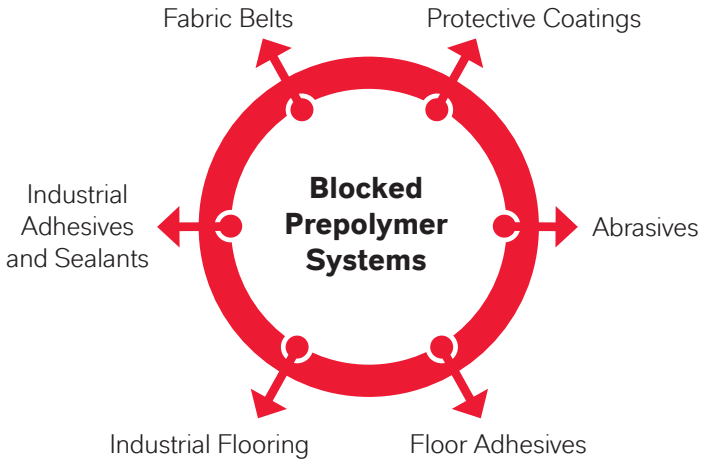
- LF technology for improved industrial hygiene and lower hazard classifications
- 1K system to avoid mixing and handling
- Controlled cure
- Enhanced performance with non-traditional raw materials

Selected Product Grades	Chemistry	Nominal NCO content (%)	Solids (%)	Viscosity at 70°C (mPa·s)	Deblocking Temperature (°C)
Adiprene® K LFM E820	LF MDI	3.70	100	4,200	150 - 180

Data provided in the table above is characteristic of the product grade, and does not constitute a specification. Further information is given in technical and material safety data sheets for individual Adiprene® K products. Samples, supplementary data, formulating advice and papers/ presentations giving further details of our blocked prepolymer chemistry can be supplied on request.

BLOCKED PREPOLYMERS FOR ELASTOMERS, COATINGS, AND BINDERS

LANXESS is at the forefront of blocked prepolymer technology and our products, designed as solvent-borne and 100% solids, meet the requirements of high performance elastomer, coating and binder formulations across a wide range of application areas.



LANXESS URETHANE SYSTEMS IS LEADING WITH TECHNOLOGY AND INNOVATION

We provide our customers with decades of urethane chemistry know-how, comprehensive application expertise, and deep manufacturing experience. LANXESS can provide custom formulations, contact us about your requirements.

In addition to Trixene® and Adiprene® blocked prepolymers, LANXESS also offers Trixene® BI and Trixene® Aqua blocked isocyanates, Witcobond® polyurethane dispersions and Adiprene® LF and Trixene® products, which are innovative Low Free (LF) isocyanate prepolymer systems for a range of elastomers, coatings, adhesives and sealants.

Specialized provider of urethane systems, tailored to meet specific customer needs

Truly global and diverse coverage, offering quick and flexible responses to customer needs

Strong focus on sustainability with a broad portfolio providing performance, processing, and EH&S advantages

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